

scriptions were adequate in both study periods according to recent guidelines. GPA co-prescription with NSAIDs remains greatly suboptimal.

MUSCULAR-SKELETAL DISORDERS – Conceptual Papers & Research on Methods

PMS71

INDIRECT TREATMENT COMPARISONS OF BIOLOGIC THERAPIES FOR RHEUMATOID ARTHRITIS

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OBJECTIVES: To compare the efficacy results of biological therapies for rheumatoid arthritis (RA) using indirect treatment comparisons and meta-regression techniques. **METHODS:** We performed a literature search to identify the randomized clinical trials (RCTs) of biological therapies for RA. Using these studies we created a network and developed two random effects, logistic regression models (6- and 12-months), using the ACR-50 as the primary outcome. We chose mean disease duration and mean baseline HAQ-DI score as meta-regression covariates, to account for heterogeneity between trials, as these have prognostic value in determining the effect of RA treatment. **RESULTS:** We included 18 RCTs in the 6-month analysis and 10 RCTs in the 12-month analysis. Eight biologic agents are included in the 6-month analysis and six in the 12-month. The results of the 6-month analysis suggest that the eight biologic agents are significantly more effective than the comparator ($p < 0.05$): Certolizumab (log odds ratio, median = 2.6), rituximab (1.7), adalimumab (1.6), infliximab (1.6), etanercept (1.4), golimumab (1.3), abatacept (1.2), and anakinra (1.0). The results also indicate that methotrexate (MTX) is significantly more effective than placebo (0.7). The parameter values for the 12-month analysis are similar, with the effectiveness of the biologics following the same order, but without golimumab and anakinra. **CONCLUSIONS:** Our results suggest that biologic treatments are more effective than MTX or placebo, but they may differ from one another. There are differences in the outcomes depending on whether we evaluate the ACR-50 at 6-months or 12-months. Biologic agents seem to be more effective with longer disease duration.

PMS72

A NEW METHODOLOGY TO ASSESS CLINICAL CHANGE USING CHARTS IN RHEUMATOID ARTHRITIS (RA) PATIENTS ON TNF BLOCKERS

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BACKGROUND: Charting across practices for RA patients varies greatly and rarely uses formal measures to assess treatment effectiveness outside clinical trials. **OBJECTIVES:** To develop a tool to assess treatment effectiveness in real-world practice using information commonly found in charts. **METHODS:** From an ongoing chart audit, a sample of ten de-identified charts of RA patients initiating TNF blocker treatment was reviewed by four clinical rheumatologists to determine useful variables commonly found in charts. National guidelines were reviewed to determine which variables are used to assess treatment effectiveness in clinical trials. A scale was created and defined for each variable. Criteria to assign an overall outcome change score from baseline through follow-up were created. Three additional rheumatologists were added to test the scale using 51 additional charts. Each chart was reviewed by two pairs of rheumatologists. Sufficient inter-rater reliability could not be achieved due to lack of consistent data, so differences in ratings were reconciled by discussion between raters and final scores were assigned by consensus. If consensus could not be reached, a third pair of rheumatologists reviewed the chart and the final score was assigned by consensus. **RESULTS:** Key available variables identified were: patient joint pain, synovitis, patient global assessment, lab markers (CRP and ESR), patient-reported outcomes surveys, and other (fatigue, physician global assessment, morning stiffness, and radiographic information). All variables were scored much worse, worse, no change, better, and much better from the baseline to the follow-up visit. An overall outcome change score was assigned using the same scale. Missing data were considered no change. Clinical judgment was an essential component to the score. Agreement was good between pairs of raters; 53% of initial scores matched and 39% were within one category. **CONCLUSIONS:** A rating scale can be applied by experienced clinicians and used for comparative effectiveness research.

PMS73

OPERATIVE RISK OF STAGED BILATERAL KNEE REPLACEMENT IS UNDER-ESTIMATED IN RETROSPECTIVE STUDIES

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OBJECTIVES: Surgical options for patients with symptomatic bilateral knee osteoarthritis are 1) simultaneous bilateral total knee arthroplasty (BTKA) under one anesthesia and 2) staged total knee arthroplasty (STKA) with two distinct operations separated by a few days up to one year. A number of studies have compared post-operative complications after BTKA versus STKA by simply collecting and then contrasting outcomes collected retrospectively. However, this methodology is biased because it fails to account for the patients who had STKA planned but who never completed the second stage because they died or developed a serious post-operative

complication after the first operation, leading to cancellation of the second STKA. The purpose of this study was to demonstrate the misclassification bias associated with simply comparing operative outcomes after BTKA versus STKA. **METHODS:** To demonstrate the bias, a mathematical derivation and graphical presentation were developed. **RESULTS:** First, we mathematically demonstrated that the observed proportion of complication (P_{observed}) in patients who completed both STKA operations underestimates the true proportion of complication (P_{true}). Second, we graphically demonstrated that STKA always appears to be safer than BTKA even if when the proportion of post-operative complications observed is held constant. When data were simulated using a true odds ratio of 1, the observed odds ratio ranged from 0.899 to 0.557 for various combination of other probabilities. **CONCLUSIONS:** Most published studies have reported that post-operative complications are lower for STKA compared with BTKA. However, our analysis indicates that any conclusions based simply on retrospective analysis of subjects who successfully completed STKA is biased because it includes only cases that recovered after the first operation rather than all of the patients that had STKA planned. Absent a prospective study, the only fair and unbiased comparison of post-operative complications between STKA and BTKA requires adjustments to account for this bias.

PMS74

USE OF A DISEASE-SPECIFIC INSTRUMENT IN ECONOMIC EVALUATIONS: MAPPING WOMAC ONTO THE EQ-5D UTILITY INDEX

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OBJECTIVES: To map the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) onto the EQ-5D utility index in patients with knee osteoarthritis (OA). **METHODS:** A consecutive sample of patients ($n = 258$) with diagnosed knee OA completed both the WOMAC and the EQ-5D. Regression models with ordinary least squares (OLS) or the censored least absolute deviations (CLAD) as the estimator were used to establish the mapping function. The WOMAC was represented as explanatory variables in four ways: (a) total score; (b) domain scores (i.e., pain, stiffness, and physical function), (c) domain scores plus pairwise interaction terms to account for possible nonlinearities; and (d) individual item scores. Goodness-of-fit criteria included mean absolute error (MAE, the primary criterion) and root mean squared error (RMSE) obtained using an iterative random sampling procedure. Prediction precision was evaluated at individual patient level and at the group level. **RESULTS:** The model using OLS estimator and WOMAC domain scores as explanatory variables had the best fit and was chosen as the preferred mapping model. The prediction error at individual level exceeded the maximal tolerance value (i.e. the minimally important difference of EQ-5D) in about 16% of patients. At group level, the width of 95% CI of prediction errors varied from 0.0176 at a sample size of 400 to 0.0359 at a sample size of 100. **CONCLUSIONS:** EQ-5D scores can be predicted using WOMAC domain scores with an acceptable precision at both the individual and group levels in patients with mild to moderate knee OA.

PMS75

METHODS FOR INTERPRETING TUMOR NECROSIS FACTOR (TNF) BLOCKER DOSING AND TREATMENT PATTERNS FROM PHARMACY AND PROFESSIONAL CLAIMS

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OBJECTIVES: Despite using fully adjudicated claims, analyzing biologics treatment patterns requires reliable data cleaning and imputation methods for both pharmacy and professional claims. Self-injected agents with longer dosing intervals present unique challenges for data analysis. We developed methods to improve interpretability while minimizing data loss using TNF blocker claims. **METHODS:** A large health plan claims database was used to obtain 3,725 Psoriasis and/or Psoriatic Arthritis subjects initiating adalimumab (ADL) or etanercept (ETN) between January 1, 2003 and March 31, 2009; and were enrolled for 360 days pre- and ≥ 180 days post-index (first TNF claim). Patients were excluded if they had other inflammatory disorders pre- or post-index or received any biologic pre-index. We reviewed patients' drug dispensing histories, established acceptable ranges for key claim values, and developed imputation rules that leveraged allowed reimbursements and dispensed quantities when other values were discrepant or missing. For professional claims, we divided total doses across weeks between fills to obtain average weekly dose. **RESULTS:** A total of 89.2% of 46,206 ETN and 94.6% of the 3,470 ADL claims were from pharmacies. 9.7% subjects with ≤ 0 reimbursed amounts on index were excluded, as were 0.9% with extreme quantity values ($>48/ >16$ for ETN pharmacy/professional claims, >12 for ADL) and 1.0% patients with extreme weekly dose values in any claim (>250 mg for ETN, >200 mg for ADL). 8.8% subjects had >1 same-day claims, which were sorted in descending order of charge, allowed, and paid, with the top claim retained. After these steps, 3065 (82.3%) subjects remained in the cohort. **CONCLUSIONS:** Analyzing TNF blocker treatment patterns from claims requires adjustments for weekly dosing schedules and for professional claims that reflect dispensing of supplies for home injection. However, the limited dosing schedules for ADL and ETN allow for data cleaning strategies that address these challenges while retaining the vast majority of data.